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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)		Application Number	10/602,938
		Filing Date	June 24, 2003
		First Named Inventor	Thompson M. Sloane et al.
		Art Unit	3748
		Examiner Name	Zelalem Eshete
Total Number of Pages in This Submission		Attorney Docket Number	GP-303216 (8540R-000038)

ENCLOSURES (check all that apply)		
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Firm or Individual name	Harness, Dickey & Pierce, P.L.C.	Attorney Name Anna M. Budde
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Date	January 19, 2007	

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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application No.: 10/602,938  
Filing Date: June 24, 2003  
Applicant: Thompson M. Sloane, et al.  
Group Art Unit: 3748  
Examiner: Zelalem Eshete  
Title: ACETYLENE-BASED ADDITION FOR  
HOMOGENEOUS-CHARGE COMPRESSION IGNITION  
(HCCI) ENGINE OPERATION  
Attorney Docket: GP-303216 (8540R-000038)

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**SUPPLEMENTAL REPLY BRIEF FILED UNDER 37 C.F.R. §§ 41.43(b) and 41.41**

This is Applicants' Supplemental Reply to the Examiner's Answer mailed November 22, 2006.

Appellants respectfully file another reply brief to respond to the new arguments presented in the supplemental Examiner's Answer mailed November 22, 2006. Appellants maintain and assert once again their arguments from the Reply Brief filed August 21, 2006, and Appellants limit their additional comments set out in this Supplemental Reply Brief to the new Examiner's argument set out in the last paragraph on page 11 of the supplemental Examiner's Answer.

### **Supplemental Reply to Examiner's Arguments**

Appellants reply that, with regard to claims 10, 11, 26, and 34, not only does the combination of the Dahung, Bundrick, and Gonzalez references lack any mention of ranges based on stoichiometry of the acetylene-based compound and its behavior in combination with fuel in a specialized HCCI engine, but the combination of these references also lacks any guidance for including acetylene in a charge to a compression ignition engine.

The Examiner's reliance on *In re Aller* is misplaced. In the *Aller* case, the claim at issue was to a process for decomposing isopropyl benzene hydroperoxide with 25-70% aqueous sulfuric acid at 40-80°C, while the reference taught decomposing isopropyl benzene hydroperoxide with 10% aqueous sulfuric acid at 100°C. *Aller*, 105 USPQ 233, 234 (CCPA 1955). The court said that a change in temperature or concentration of reactants would normally not be patentable, but may be patentable if such changes produced a new and unexpected result. *Id.* at 235. Unlike the *Aller* case, there is no single reference here that teaches a claimed method; there are no example methods laid out in the prior art with given parameters. There is no starting point for the automotive engineer to optimize.

The Dahung publication teaches using a pilot fuel to ignite a fuel than cannot be self-ignited (the ), but this teaching would lead one to omit the pilot fuel entirely in the case of a HCCI engine, in which the fuel auto-ignites on compression. The Examiner cites the Bundrick patent teaches that many fluid fuels are known, and include acetylene. Still, following Dahung, one would not use the pilot fuel if the main fuel self-ignited. Furthermore, the Dahung publication handles high load conditions by introducing the main fuel into the combustion chamber before the pilot fuel, and,

alternatively, handles low load conditions by injecting the pilot fuel into the combustion chamber first, then the main fuel. Dahung, col. 2, line 47 to col. 3, line 16. Thus, the references teach that a pilot fuel is needed to fuel that does not self-ignite, and that the separate introduction of the pilot fuel (earlier or later) can control fuel ignition during different engine loads. The Gonzales patent further adds a spark plug-assisted ignition, in which the plug fires a spark at the same time as the pilot injection. Col. 5, lines 39-43.

The skilled artisan thus takes from these references a knowledge that a pilot gas is needed when a fuel that does not self-ignite is used, and that the introduction of the pilot gas can precede or follow introduction of the main fuel, or can be assisted in igniting the fuel with a spark plug.

There is no passage that mentions injection of concurrent injection, or adding a second, self-ignitable fuel to a fuel that already self-ignites, or, if that is done, how such fuels are apportioned in the combustion mixture. There is no basis on which to select either fuels or amounts — save random trial and error. This is a far cry from the situation in *Aller*, where an actual example of the reaction was set out, and the applicants merely varied reaction conditions in ways well-known to chemists. [The undersigned chemist can attest that effects of temperature and concentration of reactants on reaction rates are covered early and often in every chemist's education.] The present situation is instead like that of *In re O'Farrell*, 853 F.2d 849, 7 USPQ2d 1673 (Fed. Cir. 1988), where the engineer is left to "vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result." *Id.* at 903, 7 USPQ2d at 1681.

Also for these further considerations, then, Appellants respectfully request this Honorable Board to REVERSE the final rejection of the claims.

Respectfully submitted,

Dated: January 19, 2007

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